

Supplementary Table 1. FilmArray BioThreat Panel full results.

Sample ID	Symptomatic? ¹	Patient? ²	FilmArray BioThreat Panel results					RT-PCR results ³	
			Material	Run date	Zaire ebolavirus		Other detected targets	Date	Ct values ⁵
					Identification	Mean Cp ⁴			
PON366	S	HCW	Blood	06/19/14	Negative	>27	<i>Staph. Enterotoxin</i> ⁶	Unknown	Unknown
PON394	A	P	Blood	06/19/14	Negative	>27	Not detected	Unknown	Unknown
BT002	A	P	Blood	07/04/14	Negative	>27	Not detected	Unknown	Unknown
BT003	A	P	Blood	07/04/14	Negative	>27	Not detected	Unknown	Unknown
BT004	A	P	Blood	07/05/14	Negative	>27	Not detected	Unknown	Unknown
BT006	A	P	Blood	07/05/14	Negative	>27	<i>Yersinia pestis</i> ⁷	Unknown	Unknown
BT007	A	P	Blood	07/05/14	Negative	>27	Not detected	Unknown	Unknown
BT008	A	P	Blood	07/05/14	Negative	>27	Not detected	Unknown	Unknown
BT009	A	HCW	Blood	07/07/14	Negative	>27	Not detected	Unknown	Unknown
BT010	A	P	Blood	07/07/14	Negative	>27	Not detected	Unknown	Unknown
PON337	S	P	Blood	07/08/14	Negative	>27	Not detected	Unknown	Unknown
PON342	S	P	Blood	07/08/14	Negative	>27	Not detected	Unknown	Unknown
PON348	S	P	Blood	07/08/14	Negative	>27	Not detected	Unknown	Unknown
PON346	S	P	Blood	07/09/14	Negative	>27	Not detected	Unknown	Unknown
PON349	S	P	Blood	07/09/14	Negative	>27	Not detected	Unknown	Unknown
PON354	S	P	Blood	07/09/14	Negative	>27	Not detected	Unknown	Unknown
PON337	S	P	Blood	07/21/14	Negative	>27	Not detected	Unknown	Unknown
PON367	S	P	Blood	07/21/14	Negative	>27	Not detected	Unknown	Unknown
PON403	S	P	Blood	07/22/14	Negative	>27	Not detected	Unknown	Unknown
PON404	S	P	Blood	07/22/14	Negative	>27	Not detected	Unknown	Unknown
PON405	S	P	Blood	07/22/14	Negative	>27	Not detected	Unknown	Unknown
PON410	S	P	Blood	07/25/14	Negative	>27	Not detected	Unknown	Unknown
PON450	S	P	Blood	08/11/14	Negative	>27	Not detected	Unknown	Unknown
PON451	S	P	Blood	08/12/14	Negative	>27	Not detected	Unknown	Unknown
PON490	S	P	Blood	08/23/14	Negative	>27	Not detected	Unknown	Unknown
PON456	S	P	Blood	08/26/14	Negative	>27	Not detected	Unknown	Unknown
PON492	S	P	Blood	09/01/14	Negative	>27	Not detected	Unknown	Unknown
PON461	S	P	Blood	09/03/14	Negative	>27	Not detected	Unknown	Unknown
PON462	S	HCW	Blood	09/03/14	Negative	>27	Not detected	Unknown	Unknown
PON530 (Patient 1)	A	HCW	Blood	10/06/14	Positive	18.70	Not detected	10/10/14	26/23

PON534	A	HCW	Blood	10/07/14	Negative	>27	Not detected	Unknown	Unknown
PON588	A	HCW	Blood	10/09/14	Negative	>27	Not detected	Unknown	Unknown
PON589	A	HCW	Blood	10/13/14	Negative	>27	Not detected	Unknown	Unknown
PON590	A	HCW	Blood	10/14/14	Negative	>27	Not detected	Unknown	Unknown
PON591	S	P	Blood	10/14/14	Negative	>27	Not detected	Unknown	Unknown
PON592	S	P	Blood	10/14/14	Negative	>27	Not detected	Unknown	Unknown
PON593	S	P	Blood	10/14/14	Negative	>27	Not detected	Unknown	Unknown
PON595	A	HCW	Blood	10/15/14	Negative	>27	Not detected	Unknown	Unknown
PON596	A	HCW	Blood	10/15/14	Negative	>27	Not detected	Unknown	Unknown
PON597	S	P	Blood	10/15/14	Negative	>27	Not detected	Unknown	Unknown
PON598 (Patient 2)	S	P	Throat swab	10/16/14	Positive	9.90	Not detected	Not done	Not done
PON599	A	HCW	Blood	10/20/14	Negative	>27	Not detected	Unknown	Unknown
PON700	A	HCW	Blood	10/22/14	Negative	>27	Not detected	Unknown	Unknown
PON702	A	HCW	Blood	10/24/14	Negative	>27	Not detected	Unknown	Unknown
PON703	S	HCW	Blood	10/24/14	Negative	>27	Not detected	Unknown	Unknown
PON704 (patient 3)	S	HCW	Urine	10/24/14	Negative	>27	Not detected	10/27/14	25/24 ⁸
PON705	A	HCW	Blood	10/24/14	Negative	>27	Not detected	Unknown	Unknown
PON706 (Patient 4)	S	HCW	Blood	10/26/14	Positive	16.00	Not detected	10/28/14	25/24
PON707	S	HCW	Blood	10/26/14	Negative	>27	Not detected	Unknown	Unknown
PON708	A	HCW	Blood	10/26/14	Negative	>27	Not detected	Unknown	Unknown
PON709 (Patient 5)	S	HCW	Blood	11/01/14	Positive	15.10	Not detected	11/05/14	23/23
PON710	S	HCW	Blood	11/04/14	Negative	>27	Not detected	Unknown	Unknown
PON711	S	HCW	Blood	11/15/14	Negative	>27	Not detected	Unknown	Unknown
PON712	S	HCW	Blood	11/18/14	Negative	>27	Not detected	Unknown	Unknown
PON713	S	HCW	Blood	11/20/14	Negative	>27	Not detected	Unknown	Unknown
PON714 (Patient 6)	S	HCW	Blood	11/21/14	Positive	11.06	Not detected	11/23/14	16/16
PON715	S	HCW	Blood	11/21/14	Negative	>27	Not detected	Unknown	Unknown
PON716	S	HCW	Blood	11/22/14	Negative	>27	Not detected	Unknown	Unknown
TLA1590	S	P	Blood	11/22/14	Negative	>27	Not detected	Unknown	Unknown
TLA1721	S	P	Blood	11/22/14	Negative	>27	Not detected	Unknown	Unknown
TLA1733	S	P	Blood	11/22/14	Negative	>27	Not detected	Unknown	Unknown
TLA1727	S	P	Blood	11/24/14	Negative	>27	Not detected	Unknown	Unknown
TLA1520	S	P	Blood	11/24/14	Negative	>27	Not detected	Unknown	Unknown
TLA1493	S	P	Blood	11/26/14	Negative	>27	Not detected	Unknown	Unknown
TLA1420	S	P	Blood	11/26/14	Negative	>27	Not detected	Unknown	Unknown

PON718	S	P	Blood	11/26/14	Negative	>27	Not detected	Unknown	Unknown
PON719	S	P	Blood	11/27/14	Negative	>27	Not detected	Unknown	Unknown
TLA11	S	P	Blood	11/27/14	Negative	>27	Not detected	Unknown	Unknown
PON720	S	P	Blood	12/01/14	Negative	>27	Not detected	Unknown	Unknown
PON721	S	P	Blood	12/02/14	Negative	>27	Not detected	Unknown	Unknown
PON722	S	P	Blood	12/04/14	Negative	>27	Not detected	Unknown	Unknown
PON723	S	P	Blood	12/08/14	Negative	>27	Not detected	Unknown	Unknown
PON728	S	P	Blood	12/17/14	Negative	>27	Not detected	Unknown	Unknown
PON729	S	P	Blood	12/23/14	Negative	>27	Not detected	Unknown	Unknown
PON730	S	P	Blood	12/29/14	Negative	>27	Not detected	Unknown	Unknown
PON731 (Patient 7)	S	P	Blood	01/06/14	Positive	10.10	Not detected	01/08/14	n/a ⁹
PON732	S	P	Blood	01/07/14	Negative	>27	Not detected	Unknown	Unknown
PON733	S	P	Blood	01/09/14	Negative	>27	Not detected	Unknown	Unknown
PON738	S	P	Blood	01/12/14	Negative	>27	Not detected	Unknown	Unknown
PON740	S	P	Blood	01/14/14	Negative	>27	Not detected	Unknown	Unknown
PON745	S	P	Blood	01/15/14	Negative	>27	Not detected	Unknown	Unknown
PON753	S	P	Blood	01/19/14	Negative	>27	Not detected	Unknown	Unknown
PON754	S	P	Blood	01/19/14	Negative	>27	Not detected	Unknown	Unknown

¹ S – symptomatic, A – asymptomatic.

² P – patient, HCW – healthcare worker.

³ All confirmatory Ebola testing was performed on whole blood specimens (obtained independently of samples used for FilmArray testing) in Kenema (subject PON530) and Bo (all other subjects) by a mobile diagnostic laboratory operated by CDC.

⁴ Both Cp and Ct values correlate with viral loads in the sample (lower Cp and Ct values indicate higher viral load). Cp values are not reported by the commercial version FilmArray system and were obtained in collaboration with BioFire Defense. For all negative samples the Cp values were above 27, which is a detection threshold.

⁵ Ct values reflect the results of two confirmatory real-time RT-PCR assays (NP/VP40) and were obtained in collaboration with DHMT.

⁶ Staphylococcal enterotoxin gene – indicates presence of the *Staphylococcus aureus* carrying staphylococcal enterotoxin B (SEB) gene – it was not confirmed by an independent assay.

⁷ Detection of *Yersinia pestis* by BT Panel was not confirmed by any independent diagnostic assay but was consistent with the clinical presentation of the patient.

⁸ Confirmatory PCR was performed on whole blood.

⁹ n/a – not available.

Detection of *Zaire ebolavirus* in the blood of asymptomatic patient 1.

Extended discussion.

While it was previously reported that asymptomatic Ebola infection in humans is possible (1) it is often assumed that viral titers in pre-symptomatic persons infected with Ebola are too low for detection by commonly used RT-PCR-based methods (2). The BT/Biothreat-E Panel has an estimated live virus detection limit between 6.0×10^3 and 2.0×10^4 pfu/mL (3), which is generally encountered only after the onset of symptoms (4, 5). However, the detection of the virus in Patient 1 prior to the onset of symptoms indicates that this assumption may not be true in certain cases. Although this is just a single observation, the result suggests that at least in some individuals viral loads in asymptomatic patients may reach PCR-detectable levels before the onset of the symptoms.

The crossing point (Cp) value is the PCR cycle during which the fluorescence signal rises above the background, and a lower Cp value indicates a higher concentration of the targeted virus in the specimen being tested. Cp results for the FilmArray BT Panel are not commercially available, but were obtained in collaboration with BioFire Defense for the six Ebola-positive patients. The Cp value for Patient 1 was less than 19, which is within the detection range of the BT Panel but close to the detection limit, indicates relatively low virus concentration in the sample (BioFire Defense, personal communication). This result suggests that it may be possible to screen exposed but asymptomatic individuals for Ebola in the day or so prior to onset of fever. It is important to note that the possibility of early detection of the virus does not counter the overwhelming epidemiological evidence showing that infected individuals are not contagious until they are symptomatic and releasing body fluids (6). There are no documented cases of human-to-human Ebola virus transmission occurring after contact with asymptomatic patients with or without blood viral titers. Also, viral titers vary dramatically between individuals with symptomatic Ebola (7), and variations would also be expected in asymptomatic but infected persons.

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